

What is claimed is:

1. A geophone, comprising:

a housing;

a first terminal positioned on one side of the housing;

an electrically conductive path having a first end coupled to the first terminal;

a first coil resiliently mounted within the housing and coupled to the first end of the electrically conductive path;

a second terminal positioned on another side of the housing

a second end of the electrically conductive path coupled to the second terminal ;

a second coil resiliently mounted within the housing and coupled to the second end of the electrically conductive path; and

a magnet mounted within the housing.

2. The geophone of claim 1, wherein the magnet and the electrically conductive path are electrically insulated from each other.

3. The geophone of claim 1, wherein the housing, the magnet, and the electrically conductive path are electrically insulated from each other.

4. The geophone of claim 1, wherein the first end of the conductive path comprises:

3 a first end plate support;
4 a first spring; and
5 a first coil support.

1 5. The geophone of claim 1, wherein the second end of the conductive path
2 comprises:

3 a second end plate support;
4 a second spring; and
5 a second coil support.

1 6. The geophone of claim 4, wherein the second end of the conductive path
2 comprises:

3 a second end plate support;
4 a second spring; and
5 a second coil support.

1 7. The geophone of claim 1, further comprising:

2 a first magnet support coupled to the housing and the magnet; and
3 a second magnet support coupled to the housing and the magnet.

1 8. The geophone of claim 1, wherein at least a portion of the surface of the
2 magnet is electrically non-conductive.

1 9. The geophone of claim 7, wherein at least a portion of the surface of at
2 least one of the magnet, the first magnet support and the second magnet
3 support is electrically non-conductive.

1 10. The geophone of claim 1, wherein one or more electrically conductive
2 elements include insulative surfaces for insulating the one or more electrically
3 conductive elements from one or more other electrically conductive elements.

1 11. A geophone, comprising:

2 a housing including a first and a second end opposite the first end;
3 a first end plate coupled to the first end of the housing;
4 a second end plate coupled to the second end of the housing;
5 a first end plate support coupled to the first end plate;
6 a second end plate support coupled to the second end plate;
7 a first magnet support coupled to the first end plate support;
8 a second magnet support coupled to the second end plate support;
9 a magnet coupled to the first and second magnet supports;
10 a first resilient ring coupled to the first end plate support;
11 a second resilient ring coupled to the second end plate support;
12 a first spring coupled to the first end plate support;
13 a second spring coupled to the second end plate support;
14 a first coil support coupled to the first spring;
15 a second coil support coupled to the second spring;

16

a first coil coupled to the first coil support; and

17

a second coil coupled to the second coil support.

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12. The geophone of claim 11, further comprising:

2

a first retaining ring for coupling the first coil support to the first

3

spring; and

4

a second retaining ring for coupling the second coil support to the

5

second spring.

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13. The geophone of claim 11, wherein at least a portion of the surface of at

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least one of the first end plate, the second end plate, the magnet, the first

3

magnet support, the second magnet support, first coil support, and second coil

4

support is electrically non-conductive

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14. The geophone of claim 13, wherein the non-conductive surface is

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selected from a group consisting of (i) nonconductive paint, (ii) nonconductive

3

adhesive, (iii) an enamel layer, (iv) an oxidized layer, and (v) an anodized layer,

4

affixed to the surface of the portion.

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15. The geophone of claim 11, wherein at least a portion of the surfaces of

2

the first and second end plate supports are electrically conductive.

1 16. The geophone of claim 11, wherein at least a portion of the surfaces of
2 the first and second end plate supports are resistant to oxidation.

1 17. A geophone, comprising:

2 a housing;

3 an electrically conductive terminal on one end of the housing;

4 another electrically conductive terminal on the opposite end of the,
5 housing;

6 a magnet mounted within the housing; and

7 at least one coil resiliently mounted within the housing.

1 18. A method of electrically insulating a first electrically conductive component
2 from at least one second electrically conductive component within a geophone,
3 comprising:

4 treating a surface of at least one of the first and second
5 components to render at least a portion of the treated surface electrically
6 non-conductive.

1 19. The method of claim 18, wherein the treatment comprises disposing at
2 least one of (i) nonconductive paint, (ii) nonconductive adhesive, (iii) an enamel
3 layer, (iv) an oxidized layer, and (v) an anodized layer, on the surface.

Sub A31
20. A seismic acquisition system, comprising:

2 at least one geophone, each geophone comprising:
3 a housing;
4 a first electrically conductive terminal on one side of the housing;
5 a first coil resiliently mounted within the housing and operably
6 coupled to the first terminal;
7 a second electrically conductive terminal on another side of the
8 housing;
9 a second coil resiliently mounted within the housing and operably
10 coupled to the second terminal;
11 a magnet mounted within the housing; and
12 a controller operably coupled to the geophone.

1 21. The system of claim 20, wherein the magnet, the first terminal, and the
2 second terminal are electrically insulated from each other.

1 22. The system of claim 20, wherein the housing, the magnet, the first
2 terminal, and the second terminal are electrically insulated from each other.

1 23. The system of claim 20, wherein the first terminal comprises:
2 a first end plate support;
3 a first spring; and
4 a first coil support.
5

1 24. The system of claim 20, wherein the second terminal comprises:

2 a second end plate support;

3 a second spring; and

4 a second coil support.

1 25. The system of claim 23, wherein the second terminal comprises:

2 a second end plate support;

3 a second spring; and

4 a second coil support.

1 26. The system of claim 20, further comprising:

2 a first magnet support coupled to the housing and the magnet; and

3 a second magnet support coupled to the housing and the magnet.

1 27. The system of claim 20, wherein at least a portion of the surface of the
2 magnet is electrically non-conductive.

1 28. The system of claim 26, wherein at least a portion of the surface of at
2 least one of the magnet, the first magnet support and the second magnet
3 support is electrically non-conductive.

1 29. The system of claim 20, wherein one or more electrically conductive
2 elements include insulative surfaces for insulating the one or more electrically
3 conductive elements from one or more other electrically conductive elements.

1 30. The system of claim 20, wherein the first terminal and the second terminal
2 are electrically insulated from one or more of the elements of the geophone by
3 an insulating layer disposed on the surface of at least one of the elements, the
4 layer comprising at least one of the or more of (i) nonconductive paint, (ii)
5 nonconductive adhesive, (iii) an enamel layer, (iv) an oxidized layer, and (v) an
6 anodized layer.

7 surfaces.

1 31. A sensor housing for use in seismic data acquisition, the housing
2 comprising:

- 3 an outer case having a first end and a second end, the first and
4 second ends being on opposing sides of the case;
5 a first terminal coupled to the first end; and
6 a second terminal coupled to the second end.

1 32. A sensor housing according to claim 31 wherein the first end further
2 comprises a first end plate, the second end further comprises a second end
3 plate, the first terminal is coupled to the first end plate, and the second terminal
4 is coupled to the second end plate.
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1 33. The sensor housing of claim 32 wherein at least the first end plate and
2 first terminal are integrally formed.

1 34. The sensor housing of claim 33, wherein at least one end plate is
2 electrically insulated from the outer case.

1 35. The sensor housing of claim 33 wherein at least one end plate is
2 electrically connected to the outer case.

1 36. The sensor housing of claim 31, wherein the first terminal forms a first end
2 plate on the first end of the outer case and the second terminal forms an end
3 plate on the second of the outer case.

1 37. The sensor housing of claim 36 wherein the first end plate and the second
2 end plate are electrically insulated from the outer case.

1 38. The sensor housing of claim 36 wherein the first end plate and the second
2 end plate are electrically connected to the outer case.

1 39. The sensor housing of claim 36 wherein the first end plate is electrically
2 insulated from the outer case and the second end plate is electrically insulated
3 from the outer case.

1 40. The sensor housing of claim 32 wherein at least one end plate further
2 comprises a first member and a second member, the second member being
3 concentrically disposed about the first member.

1 41. The sensor housing of claim 40, wherein the first member is the first
2 terminal.

1 42. The sensor housing of claim 41 further comprising an insulating layer
2 disposed between the first and second members.

1 43. The sensor housing of claim 42, wherein the insulating layer is an
2 adhesive.

2 44. A geophone having a plurality of first electrically conductive parts and a
3 plurality of second electrically conductive parts, the first plurality of parts being
4 interconnected to form an electrically conductive pathway, the electrically
5 conductive pathway being insulated from the second plurality of parts by an
6 electrically insulating layer disposed between the electrically conductive pathway
and the second plurality of parts.

1 45. The geophone of claim 44, wherein the electrically insulating layer is
2 selected from a group consisting of (i) nonconductive paint, (ii) nonconductive
3 adhesive, (iii) an enamel layer, (iv) an oxidized layer, and (v) an anodized layer,

4 the insulating layer being disposed on one or more of the first plurality of parts
5 and second plurality of parts.

46. A geophone housing comprising a housing, a first terminal positioned on a
first side of the housing and a second terminal positioned on a second side of
the housing

47. A geophone comprising a first plurality of electrically conductive elements
and a second plurality of electrically conductive elements, wherein the first
plurality of electrically conductive elements include insulative surfaces for
insulating the first plurality of electrically conductive elements from the second
plurality of electrically conductive elements.